

**Empirical Evaluation of the READY! for Kindergarten Program on
Kindergarten Readiness Scores: Evaluating a Multi-Ethnic and Multi-
Linguistic Sample**

REPORT ON KENNEWICK SCHOOL DISTRICT DATA 2005-2008

Submitted to:

Thrive by Five Washington

1218 Third Avenue
8th Floor
Seattle, WA 98101

Submitted by:

Paul Strand, Ph.D., Principal Investigator

Department of Psychology, Washington State University Tri-Cities

Submitted on:

August 5, 2009

Table of Contents

I. PREAMBLE 3

II. EXECUTIVE SUMMARY/ABSTRACT 4

III. OVERVIEW AND PLAN 5

IV. EVALUATION STUDY PLAN..... 6

Participants..... 6

Measures..... 6

Attendance..... 6

Kindergarten Readiness..... 7

Pre-Reading Assessments..... 7

Pre-Math Assessments..... 7

V. RESULTS 8

Exploring Dosage Effects..... 9

Exploring Developmental Ordering Effects..... 9

Fletcher’s Place Enhancement..... 10

F. DISCUSSION..... 10

G. REFERENCES 12

Tables 1-7..... 13-19

Figures 1 & 2..... 20-21

Appendices (A & B) 23-24

I. PREAMBLE

The present paper reports on the results of an effort to evaluate the Ready for Kindergarten (READY!) program as a means for improving Kindergarten readiness scores. This is the first of two studies for this project, funded by Thrive by Five Washington. It involves data gathered at the Kennewick School District (KSD) from 2005 to 2008. The second study is currently in progress at the Othello School District. A final report for the Othello study will be completed by April 2010.

II. EXECUTIVE SUMMARY/ABSTRACT

The present study explored data gathered at KSD to determine if the entering Kindergarten Reading and Math readiness scores of children whose families were exposed to READY! differed from those who were not. The results of statistical analyses revealed that such differences did emerge for the entire sample, and also for specific subsamples. With respect to the entire sample, children whose families were exposed to READY! had statistically significant higher readiness scores than children whose families were not exposed to READY! on both entering Kindergarten Reading and Math assessments. Similar differences were observed between READY! attendees and non-attendees within the following ethnic subgroups: Caucasian, Latino, and non-Latino minority children. Similarly, higher entering Kindergarten scores were observed for READY! attendees compared to non-attendees for the subgroups of children receiving free and reduced-priced lunch and for children identified as qualifying for special education. The only group for whom this pattern of findings was not observed was children identified as English Language Learners (ELL). Although both Reading and Math scores were higher for ELL children whose families attended READY!, compared to those whose families did not, these differences were not statistically significant. Lack of statistical power stemming from a small sample size may have influenced these results.

In addition to exploring group differences, the present study also explored whether greater session attendance predicted Reading and Math performance (dosage effects), and whether or not specific session attendance and curriculum content predicted Reading and Math performance. Results revealed that greater session attendance predicted better Kindergarten assessment scores. There was no evidence for developmental timing or curriculum content effects. That is, attendance at specific sessions and at specific ages was not predictive of Reading or Math scores when controlling for total session attendance.

In sum, these results suggest that, on average, preschoolers whose parents attended READY! had statistically significant higher readiness scores than preschoolers whose parents did not attend READY! In addition, greater session attendance predicted higher entering scores in both Reading and Math. It is important to note that it is possible these results are due to self-selection effects rather than the effect of READY! on school readiness. That is, the present study did not employ a randomization of subjects, nor did it employ quasi-experimental procedures for controlling for self-selection effects. Therefore, it could be that families of otherwise high performing children were more likely to attend READY! than were the families of otherwise low performing children. Nevertheless, within the context of the limitations of this study, these are positive preliminary results for READY!.

III. OVERVIEW AND PLAN

Ready for Kindergarten (READY!) is a community-focused program for improving the Kindergarten readiness of children ages birth to five (Fielding, Kerr, & Rosier, 1998; 2004; 2007). The program is based on the assumption that parents are motivated to prepare their children for academic success, but sometimes lack the necessary skills and support. READY!'s goal is to educate parents about the core skills and competencies that determine Kindergarten readiness (Bergeson, 2005; Kagan, Britto, Kaverz, & Tarrant, 2005). The focus is on skills in the following three domains: Language and Literacy, Math and Reasoning, and Social and Emotional.

READY! sessions are offered three times per year for families of children ages zero to five. Placement into classes is based on child age to ensure that parents are obtaining age-appropriate instruction. Therefore, it is possible for parents to attend a total of 15 sessions (three per year for five years). Each lesson presents all new activities and information. To make READY! accessible, childcare is provided free of charge. Once in class, parents are introduced to other parents and the lesson begins. A PowerPoint slide show presents the curriculum in an orderly and logical manner, assuring that key concepts are covered by the trained instructor.

Every class at every age level shares activities related to pre-reading skills, math concepts, and social-emotional development. The sessions are referred to as Fall, Winter and Spring, and each session has a slightly different emphasis. Although every class includes training on all domains, additional emphasis on pre-reading is in the Fall session, math and reasoning in the Winter session, and language, social and emotion in the Spring session. Thus, if parents have a two-year-old, they will attend a class presenting information specifically about the developmental tasks and activities for children who are two years old. Approximately 20 parents are enrolled in each class, allowing them to interact and learn from each other as well as the curriculum. A trained instructor presents a researched-based lesson using a PowerPoint with video clips, handouts, and hands-on activities. The focus is on age-specific milestones for each domain. That is, parents receive educational materials and learn activities that support their child's early learning at home.

In sum, READY! provides parents *information* regarding educationally relevant child development milestones, *skills* for teaching children developmentally-appropriate pre-academic skills, and *educational materials and activities* that ensure a rich early learning environment at home.

READY! was inaugurated in the Kennewick School District (KSD) in 2002. The program has subsequently been adopted by over 90 school districts in the U.S. and Canada. The popularity of the program stems from an approach to empowering families in early learning that is rooted in research on best practices in early childhood development and education. As noted above, a defining feature of READY! is a focus on clearly defined skills and objectives that are specific to the many developmental milestones that occur across the critical early childhood years. Despite the popularity of the program, there exists a paucity of data regarding its effectiveness with respect to improving the kindergarten readiness of children exposed to the program. It was the aim of the present study to evaluate outcomes with respect to comparing the Kindergarten readiness scores of children whose families attended READY! to children from families who did not.

IV. EVALUATION STUDY PLAN

Using archival data from KSD, we sought answers to the following questions: (a) do 4-year-olds whose families participate in READY! obtain statistically significantly better scores than peers whose families are not exposed to READY! on entering Kindergarten assessment instruments, and (b) do entering Kindergarten assessment scores vary as a function of total number of sessions attended and attendance at specific sessions. Lastly, we sought to examine the impact of the READY! curriculum enhanced by the reading program, *Fletcher's Place*.

Participants.

Participants in the study included 4231 Kennewick School District Kindergarteners for whom entering Kindergarten assessments were completed at the beginning of Kindergarten for years 2005 to 2008. The Kindergarten assessment included reading and math items and was administered at all 13 elementary schools in the district. The assessment is administered one-on-one by trained assessors to every entering Kindergarten child and is available in English and Spanish.

Table 1 presents information about READY! attendance. The ethnic breakdown of the total sample and the sample of children whose families attended READY! is presented. Also presented is attendance information for families according to free and reduced-priced lunch (FRL) status, children who qualify for special education (SE) services, and those identified as English Language Learners (ELL). It should be noted that FRL, SP, and ELL data were available for years 2005 to 2007 only. The table illustrates that the majority of the children were either Caucasian or Latino. The ethnic background of the remainder of the children was Black, Asian/Pacific Islander, Native American/Alaskan, or multi-racial. Ethnic data was unavailable or left blank for 2% of children. Table 1 also presents information about READY! attendance for the total sample and according to ethnicity, FRL, SP, and ELL. The table reveals that children of FRL families and ELL children are underrepresented in terms of participation in READY! compared to their numbers in the population. With respect to ethnicity, children of Caucasian, American Indian/Alaskan, and multi-racial backgrounds were more likely to access READY! than children of Latino, Black, and Asian/Pacific Islander ethnic backgrounds.

Measures.

The measures used in the present study are described below and include: READY! session attendance, and reading and math assessments of Kindergarten readiness.

Attendance.

The Children's Reading Foundation of the Mid-Columbia maintains data concerning parent attendance at READY! classes. Participation may range from one session to 15 sessions (three sessions per year for five years). Three sessions, designated as Fall, Winter, and Spring, are offered in any given year. Each one of these sessions presents different curriculum components, although reading development is included in all three. Fall focuses on letter recognition, sounds (phonological awareness), and print concepts; Winter focuses on brain development, numbers, and problem solving using puzzles, patterning, quantities, etc.; and Spring focuses on communication skills, language development, and social-emotional relationships.

Kindergarten Readiness.

KSD utilizes an in-house assessment tool to assess Kindergarten readiness (Appendices A and B). The KSD instrument has been used district wide since the 2000-2001 school year and it measures many of the same skills as other Kindergarten assessments, including DIBELS (Good et al., 2003). The assessment instrument is designed to be a comprehensive assessment of pre-reading and pre-math skills relevant to a Kindergarten curriculum. It was developed by a committee of kindergarten teachers, the Director of Elementary Education and the district Language Arts/Literacy Specialist, based on the book *Preventing Reading Difficulties in Young Children* (National Research Council, 1998) and other relevant research.

Pre-Reading Assessments.

The KSD pre-reading assessment involved testing the children on the following six subdomains: upper- and lower-case letter recognition, letter-sound recognition, initial sound recognition, initial sound production, rhyming recognition, and rhyming production (Appendix A). The instrument allows for generating a score for each of those domains, and also a Total Reading Score (TRS). The TRS can range from a score of 0 to 100. The district has identified a score of 30 as illustrating adequate Kindergarten readiness.

For the present analyses, we generated a TRS Standard Score (TRSSS) that comprised the sum of the standard scores for each of the seven subdomains, divided by the number of subdomains (7). The correlation between the TRS and the TRSSS for the entire sample was .96. This suggests that the TRS is a good reflection of the balance of subscale scores, as opposed to being skewed by a subscale or set of subscales. Therefore, the TRS, which has the benefit of being easier to calculate, interpret and put into use by the district, was utilized as the measure of Reading for this study, and is referred to as Reading.

Pre-Math Assessments.

The KSD pre-math assessment involved testing the children on the following four subdomains: rote counting to 30, number recognition to 20, 1-step pattern recognition, and 2-step pattern recognition (Appendix B). The instrument allows for generating a score for each of those domains, and also a Total Math Score (TMS). The TMS can range from a score of 0 to 100. The district does not identify a specific readiness score for math.

For the present analyses, we generated a TMS Standard Score (TMSSS) that comprised the sum of the standard score of each of the four subdomains, divided by the number of subdomains (4). The correlation between the TMS and the TMSSS for the entire sample was .95, illustrating that the TMS provides a good estimate of the standard score with the benefit of being the score used by the district. Therefore, the TMS served as the measure of Math ability for this study, and is referred to as Math.

V. RESULTS

Table 2 illustrates kindergarten children's reading and math scores by READY! attendance and for the whole district. These data illustrate that the percentage of children whose families participated in READY! is relatively stable across the years of the study, at 15-20% of enrolled children. The scores for children whose parents attended READY! appear to be higher than those whose parents did not attend. Further analyses were conducted in order to test this, and are presented below.

A primary question of the present research had to do with the differential readiness of Kindergarteners whose families attended READY! compared to those who did not. This question was explored with respect to two outcome variables: entering Kindergarten Reading and Math scores. Table 3 shows t-test results for the total sample and several subsamples according to ethnicity, FRL, and ELL status. For the total sample, significant mean differences were observed, with READY! attendees obtaining statistically significant higher scores than non-attendees, on both Reading and Math. With respect to ethnicity, analyses were performed separately for Caucasian, Latino, and non-Latino minority subsamples. Similar to the total sample results, significant mean differences were observed such that READY! attendees scored statistically significant higher than non-attendees on both Reading and Math for each of these ethnic subgroups.

In addition to exploring the total sample and ethnic subgroups, we did similar analyses according to FRL, SE, and ELL status. For the FRL and SE subsamples, results revealed that READY! attendees scored statistically significant higher than non-attendees on both Reading and Math. Within the ELL subsample, the differences on Reading and Math scores for READY! attendees versus non-attendees were not statistically significant, although the mean values for both Reading and Math were higher for the ELL READY! attendees than the non-attendees.¹

As noted previously, KSD emphasizes reading readiness, and considers a child ready for Kindergarten if they obtain a Reading score of 30 or greater on the Kindergarten Reading assessment. Therefore, it is meaningful to evaluate READY! attendees and non-attendees with respect to the percentage of children who met that goal compared to those who did not. These percentages are reported in Table 4 for the total sample, and also for the ethnic, FRL, SE, and ELL subsamples. As can be seen from the table, the percentage of children who met that goal was 79% for READY! attendees and 55% of non-attendees, for the entire sample. Consistent with the analysis of mean differences, Chi Square analyses revealed that for all subgroups other than ELL, READY! attendees were more likely to have met the reading goal than non-attendees.

¹ The results of the analysis of the ELL sample should be interpreted with caution. That is because the ELL READY! group consisted of only 24 children. In addition, the analysis for Reading required a correction due to the fact that the groups had unequal variances for that variable (Levene's Test for Equality of Variances = 8.45, $p < .01$). Because a small sample and unequal variances reduce statistical power, there is a reasonable likelihood that significant differences across the groups favoring READY! attendees would be revealed with a larger sample with equal group variances.

Exploring Dosage Effects.

The Kennewick sample had a high degree of variability with respect to family attendance at READY! sessions. Across the entire sample, attendance ranged from 0 to 11 sessions attended, with a mean session attendance of 0.39 (sd = 1.31). Within the subsample of children whose families attended at least one READY! session, the mean attendance was 2.53 (sd = 2.10).

Table 5 presents the average Reading and Math scores for each value of session attendance. Recall that the fewest sessions attended was 0, and the highest value for session attendance was 11. Because the number of participants at the high end of this scale was low, we combined all participants who attended 9, 10, or 11 sessions into a single group. To facilitate visual inspection, these values are also presented in Figures 1 and 2, respectively. The figures reveal a generally positive relationship between session attendance and kindergarten readiness scores.

To formally evaluate these relationships, we conducted four correlational analyses, presented in Table 6. The first two analyses generated correlation coefficients for the relationship between session attendance and Reading and Math scores for the entire district sample. The other two analyses generated correlation coefficients for the relationship between session attendance and Reading and Math scores for the subsample of children whose families attended at least one READY! session. The results of these analyses illustrate moderate positive correlations between session attendance and Reading and Math for the total sample and also for the subsample of children whose families who attended at least one READY! session. These findings confirm that attendance is related to higher scores on Kindergarten Reading and Math assessments. The relationship between session attendance and Kindergarten readiness scores is higher for Reading than for Math.

Exploring Developmental Ordering Effects.

In addition to tracking total attendance, Kennewick also tracked specific session attendance for the 2008 sample of children for the three years prior to their entry into Kindergarten. This allowed for an evaluation of the importance of attending any one of the nine sessions—which is the basis for exploring if age of attendance is important. It also allows for testing the differential impact of curriculum content (which differs according to season) on Reading and Math outcomes. It should be highlighted that this analysis explores only three of the possible five years of READY! attendance because data were available for only the latter three years of the program. That is, the data have no bearing on program effects for children whose family attended when children were between the ages of 0 and 2 years. Instead, the analyses are concerned with program attendance between the ages of 2 and 4 years.

The data analytic strategy involved utilizing stepwise multiple regression equations to determine the differential predictive strength of individual session attendance on the two outcome variables, Reading and Math. However, in addition to allowing for the entry of these nine predictor variables into the equations, we also allowed for the entry of total session attendance. In that way, what is being tested is the extent to which variance for the dependent variables (Reading and Math) is predicted by attendance at the individual sessions, controlling for overall session attendance. Table 7 displays the results of these analyses. As can be seen, individual session attendance failed to improve the prediction of Reading or Math score variance beyond what was accounted for by total session attendance. The total variance accounted for by the model that included total session attendance was significant for both Reading scores ($r^2 = .071$), $F(1, 1142) = 87.20$, $p < .001$, and Math scores ($r^2 = .031$), $F(1, 1142) = 36.35$, $p < .001$.

These findings suggest that it is total number of READY! sessions attended that accounts for variance with respect to Kindergarten readiness. Attendance at specific sessions does not account for the variance with respect to readiness, which indicates that there are no developmental timing effects. That is, age of the child at time of attendance does not seem to matter. It is important to note that these findings might be impacted by self-selection. That is, it may be that the families of children who would do well on Reading and Math assessments are more likely to attend READY! sessions.

Fletcher's Place Enhancement.

Within the 2008 sample, a subsample of 35 4-year-old-children were randomly selected for exposure to a version of READY! that was enhanced with a commercially available curriculum called Fletcher's Place (FP). FP is characterized by fun and engaging experiential and large and small muscle activities designed to teach letter recognition and letter-sound skills for preschoolers. The activities involve using Sound Movements, which are hand gestures explained and modeled by a cartoon character, Fletcher the basset hound, and four friendly children on a DVD program. While viewing the DVD with their child, parents stop the program after each five minute segment and do the game, song or activity sheet together. For example, one activity is called Sound Buckets. Parents place two buckets (boxes, baskets or containers) on the floor side-by-side. Using the Sound Playing Cards provided with the DVD, they place one of the letters introduced in the DVD in front of each container (such as, /m/ and /n/). The parent and child practice saying the sounds of the letters and then begin playing. The parent holds up a picture that begins with one of the letters, says the name of the item (such as noodles or mom), and asks the child which sound he heard at the beginning of the word. The child says the sound while making the Sound Movement, and then tosses a beanbag into the correct container. All activities emphasize physical movement, verbal interactions and play, making it easy and fun to learn letter sounds and shapes.

It was hypothesized that students exposed to FP would illustrate higher scores than students who were not exposed to FP on Reading but not on Math. Preliminary data analysis involved evaluating the effectiveness of the randomization process. Unfortunately, as revealed in Table 8, a t-test revealed that the FP subsample was not representative of the population of 4-year-olds from which it was drawn ($n = 191$ entering Kindergarteners). That is, the FP sample was comprised of children who had been exposed to nearly twice as many READY! sessions as the comparison group. It is not clear why the randomization process did not work, as it involved assignment to one of the two groups on an alternating basis as parents called to register for classes. Nevertheless, it makes uninterpretable any findings from analyses seeking to disentangle the effects of FP exposure and total session exposure. For that reason, an analysis to evaluate the effects of FP on Reading and Math is not included.

F. DISCUSSION

The present study was conducted to provide data bearing on the effectiveness of READY! It utilized data gathered from Kennewick School District for years 2005 to 2008. These data allow for an exploratory study of READY!, but are not definitive because the study did not utilize a randomization or staggered baseline procedure. With that caveat in mind, it is worth noting that the results of the study are supportive of the claim that, overall, children of families exposed to READY! obtained statistically significant higher scores than children of families who were not exposed to READY! This was true for children from different ethnic groups and also for children receiving free and reduced-priced lunch (FRL). The one inconsistent finding involved

English Language Learners (ELL). For this subgroup, there were no differences on Reading or Math scores according to READY! attendance or non-attendance. This result suggests that the curriculum may not have a significant impact on ELL children, although it should be interpreted with caution due to a very small sample size and inequality of variances across the two groups. The topic clearly warrants further study.

Analyses were also conducted with respect to amount and timing of session attendance. Specifically, we were concerned with whether there was a dosage effect or effects for age at the time of attendance or for attendance at specific individual sessions. A higher number of sessions attended predicted better entering Kindergarten assessment scores. Age at the time of attendance, and attendance at specific sessions, did not add to the prediction of Reading or Math scores beyond what is accounted for by total session attendance.

There are several limitations of the present study that limit interpretation of the results and that suggest directions for future research. First and foremost, there is no pre-test measure of Reading or Math, nor are subjects randomly assigned to groups, meaning that the present results may reflect self-selection to groups. In addition, there are no quasi-experimental techniques to control for self-selection. These limitations can only be rectified by conducting a study in which experimental or quasi-experimental techniques are employed that could control for self-selection effects. Second, it is important to note that READY! is not a direct intervention to children; it is given to parents. There was no effort in the present study to measure how the intervention affects parents, or how it is that what parents learn might get transmitted to their children. To the extent that future research confirms, using more stringent experimental or quasi-experimental methods, the effectiveness of READY!, it is necessary to also identify how it is that a program that targets parents manifests in better school readiness scores for children. Of course, it is possible that there are multiple processes at work, including alterations to the home environment (i.e., the addition of READY! materials), and/or changes in how parents interact with their children (i.e., spending more time with children on academically-oriented activities, or simply spending more time with children). It should be noted in this regard that the READY! program seeks to provide parents with many novel avenues for improving the early learning environment of the child. These include an emphasis on reading aloud at least 20 minutes a day, increasing parent verbalizations to children, and providing materials that stimulate exposure and interest in developmentally appropriate and academically relevant stimuli and activities. A preliminary step to evaluating the potential pathways, therefore, is to develop and utilize a measure or multiple measures that assess how parents interact with children to improve their school readiness.

Overall, the findings of this study are supportive of READY! as a means of improving both reading and math Kindergarten readiness scores for most groups of children. The one subgroup for which these results did not hold was ELL students. Although the findings are generally positive, conclusions must be tempered due to the fact that the study did not utilize random assignment which introduces the possibility of self-selection bias.

In light of these limitations, the present study should be seen as a step forward with respect to testing the effectiveness of READY!, and not a definitive test. The results suggest that READY! attendance predicts improved Kindergarten readiness scores.

G. REFERENCES

- Barlow, D.H., & Hersen, M. (1984). *Single case experimental designs: Strategies for studying behavior change* (2nd ed.). New York: Pergamon.
- Bergeson, T. (2005). *Student readiness for Kindergarten: A survey of Kindergarten teachers in Washington State*. Olympia: Office of Superintendent of Public Instruction.
- Bordens, K.S., & Abbott, B.B. (1991). *Research design and methods: A process approach* (2nd ed.). Mountain View, CA: Mayfield Publishing Co.
- Fielding, L., Kerr, N., & Rosier, P. (1998). *The 90% reading goal*. Kennewick, WA: The New Foundation Press.
- Fielding, L., Kerr, N., & Rosier, P. (2004). *Delivering on the promise*. Kennewick, WA: The New Foundation Press.
- Fielding, L., Kerr, N., & Rosier, P. (2007). *Annual growth for all students*. Kennewick, WA: The New Foundation Press.
- Good, R.H., Kaminski, R.A., Smith, S.B., Simmons, D.C., Kameenui, E., & Wallin, J. (2003). Reviewing outcomes: Using DIBELS to evaluate Kindergarten curricula and interventions. In S. Vaughn & K.L. Briggs (Eds.). *Reading in the classroom: Systems for the observation of teaching and learning* (pp. 221-266). Baltimore: Paul H. Brookes Co.
- Kagan, S.L., Britto, P.B., Kaverz, K., & Tarrant, K., (2005). *Washington State early learning and development benchmarks*. Olympia: The State of Washington.
(<http://www.k12.wa.us/EarlyLearning/Benchmarks.aspx>).
- Strand, P.S., Cerna, S., & Skucy, J. (2007). Assessment and decision-making in early childhood education and intervention. *Journal of Child and Family Studies*, 16, 209-218.

Table 1: Demographic Characteristics of the Entire Kennewick Sample and that Sample According to READY! Attendance and Non-Attendance.

	Total Sample	READY! Attendees	Non-Attendees
Ethnicity/Race			
Caucasian	2397	551 (74%)	1846 (53%)
Latino	1273	97 (13%)	1176 (34%)
Black, Non-Latino	87	8 (1%)	79 (2%)
Asian/Pacific Islander	81	9 (1%)	72 (2%)
Amer. Ind/AK	44	11 (1%)	33 (1%)
Multi-racial	249	52 (7%)	197 (6%)
Not Provided	100	14 (2%)	86 (2%)
Total	4231	742 (100%)	3489 (100%)
Free and Reduced-Priced Lunch*			
FRL	814	73 (13%)	741 (29%)
Non-FRL	2283	477 (87%)	1806 (71%)
Total	3097	550 (100%)	2547 (100%)
Special Education*			
Yes	159	31 (6%)	128 (5%)
No	2938	519 (94%)	2419 (95%)
Total	3097	550 (100%)	2547 (100%)
English Language Learner*			
Yes	560	24 (4%)	536 (21%)
No	2537	526 (96%)	2011 (79%)
Total	3097	550 (100%)	2547 (100%)

*Indicates data were unavailable for this variable for the year 2008.

Table 2. Reading and Math Means and Standard Deviations Across the Four Years of the Study for the Total District Sample, and for those Who Attended and those Who did not Attend READY!.

Total District Sample	2005	2006	2007	2008
N	1031	1020	1045	1144
Reading Total Mean	42.52	44.27	42.44	43.13
Std Dev.	(28.65)	(29.24)	(29.30)	(25.43)
Math Total Mean	65.30	67.53	65.09	66.24
Std Dev.	(23.73)	(23.78)	(24.39)	(24.53)
READY! Attendees				
N	155	179	216	193
Reading Total Mean	56.28	59.66	57.01	59.87
Std Dev.	(27.53)	(27.08)	(28.64)	(31.34)
Math Total Mean	74.77	78.65	76.63	76.40
Std Dev.	(19.71)	(19.85)	(21.98)	(24.53)
READY! Non-Attendees				
N	876	841	829	951
Reading Total Mean	40.08	40.99	38.65	39.74
Std Dev.	(28.16)	(28.65)	(28.28)	(29.13)
Math Total Mean	63.63	65.16	62.08	64.18
Std Dev.	(24.00)	(23.89)	(24.10)	(25.12)

Table 3. Results of Independent Samples t-test Exploring Differences across Kennewick READY! Attendees and Non-Attendees for the Entire Sample, and Caucasian and Latino Subsamples

	READY! Attendees		Non-Attendees		df	t	p
	Mean	SD	Mean	SD			
Total Sample							
Reading	58.24	28.76	39.87	28.57	4239	-15.90	<.001
Math	76.67	21.74	63.78	24.31	4239	-13.36	<.001
Caucasian							
Reading	61.74	27.61	48.93	27.74	2395	-9.53	<.001
Math	79.48	20.09	70.85	21.95	2395	-8.25	<.001
Latino							
Reading	35.80	26.49	24.56	22.76	1270	-4.62	<.001
Math	61.12	23.20	52.32	23.83	1270	-3.50	<.001
Other Ethnicity							
Reading	66.46	23.92	44.47	27.74	261	-5.33	<.001
Math	79.30	20.61	66.53	22.58	261	-3.77	<.001
Free and Reduced-Priced Lunch							
Reading	40.33	29.73	28.66	24.17	812	-3.25	<.005
Math	63.44	24.01	55.29	23.95	812	-2.77	<.01
Special Education							
Reading	35.74	30.37	21.66	21.13	37.32	-2.44	<.02
Math	53.94	24.75	40.78	23.00	157	-2.82	<.01
English Language Learners (ELL)							
Reading	28.04	28.99	21.02	20.39	558	-1.62	ns
Math	54.38	25.59	48.53	22.89	558	-1.22	ns

Table 4. Percentage of Children Meeting the Kennewick Reading Goal for Total Sample and Ethnic, FRL, and ELL Subsamples for All Children and for READY! Attendees and Non-attendees.

	All Children	READY! Attendees	Non-Attendees	df	Chi Square
Total Sample	60.2	79	55	1	143**
Subsamples					
Caucasian	73	83	70	1	36.7**
Latino	32	53	31	1	20.1**
Other Ethnic	65	84	61	1	18.7**
FRL	39	53	37	1	34.9**
SP	31	48	27	1	5.13*
ELL	24	29	24	1	0.35

*p < .05

**p < .01

Table 5. Average Reading and Math Scores, and Sample Size, According to Session Attendance.

Sessions	0	1	2	3	4	5	6	7	8	9+*
Reading	40	48	62	62	63	73	68	66	75	74
Math	64	72	78	77	81	87	83	76	81	85
N	3498	312	138	88	43	44	45	28	24	25

Note: N refers to the total number of children whose families attended the number of sessions indicated. So, for example, the families of 3498 families attended 0 READY! Sessions.

*This column combines children whose families participated in 9, 10, or 11 sessions.

Table 6. Correlations Between Session Attendance and Reading and Math Scores for the Total Sample and READY! Attendees.

	Reading	Math
Total Sample	.251*	.192*
R! Attendees	.273*	.195*

*p < .001

Table 7. Results of Stepwise Multiple Regression Analyses of the Prediction of Reading and Math Scores by Individual Sessions and Total Session Attendance.

Reading Score				
Predictor	B	SE(B)	β	t
Total Session Attendance	4.57	.489	.266	9.338*
Session 1	-	-	.029	.671
Session 2	-	-	.024	.504
Session 3	-	-	.047	.997
Session 4	-	-	-.039	-.683
Session 5	-	-	-.046	-.858
Session 6	-	-	-.054	-1.214
Session 7	-	-	.004	.088
Session 8	-	-	.002	.042
Session 9	-	-	.003	.074

Math Score				
Predictor	B	SE(B)	β	t
Total Session Attendance	2.51	.417	.176	6.029*
Session 1	-	-	.062	1.412
Session 2	-	-	.051	1.051
Session 3	-	-	.048	.990
Session 4	-	-	-.002	-.033
Session 5	-	-	.003	.059
Session 6	-	-	-.076	-1.684
Session 7	-	-	-.006	1.13
Session 8	-	-	-.043	-1.034
Session 9	-	-	-.026	-.654

Note. B = unstandardized regression coefficients; SE(B) = standard error of B; β = standardized regression coefficient; t = t value. * $p < .001$.

Table 8. Results of t-test Comparing READY! Attendance for Fletcher’s Place Participants and Controls.

	Fletcher’s Attendees		Not Fletcher’s		df	t	P
	(n=34)		(n=157)				
	Mean	SD	Mean	SD			
Total Ready! Sessions	6.00	2.70	3.19	2.48	189	-5.90	<.001

Figure 1. Reading Scores as a Function of READY! Attendance

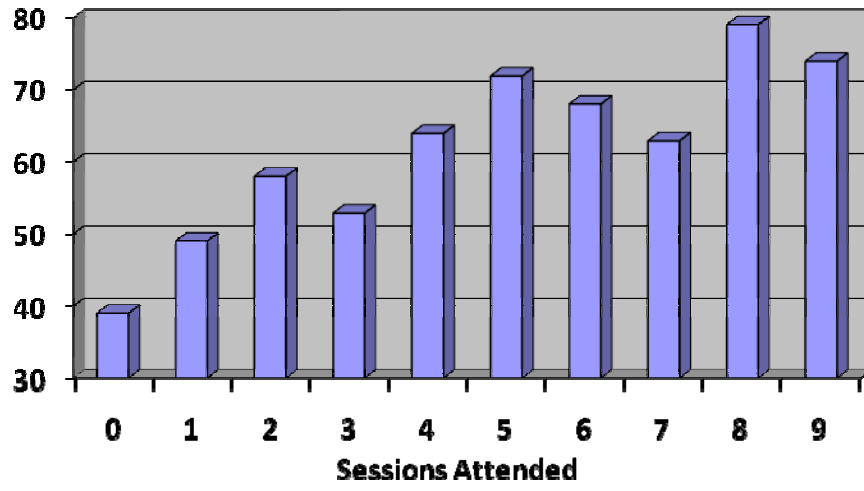
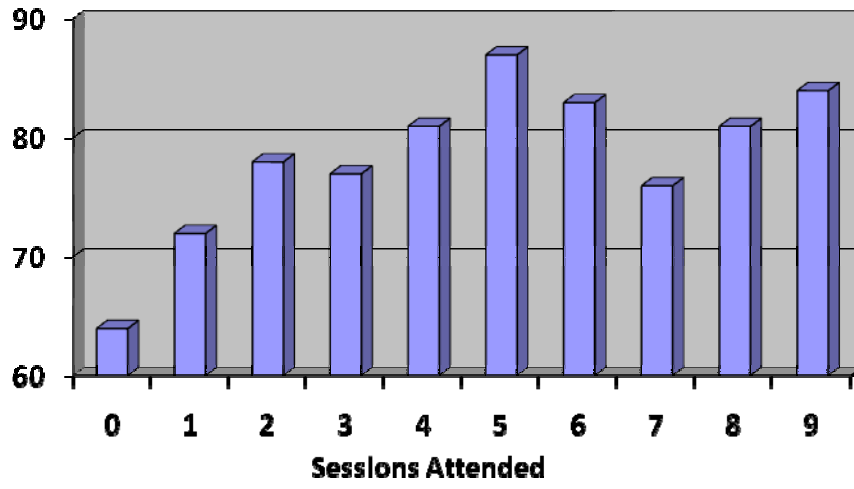


Figure 2. Math Scores as a Function of READY! Attendance



APPENDICES (A & B)

Appendix A

**KENNEWICK SCHOOL DISTRICT
KINDERGARTEN ASSESSMENT (Modified)**

Letter Recognition Using letter card, student identifies upper case letters. If student doesn't know letter, skip it and go on to next letter. Teacher records correct response by circling letter on answer sheet.

D F C B A P S Q T Z R E J G M U X H W I K N V O Y L

Letter Recognition Using letter card, student identifies lower case letters. If student doesn't know letter, skip it and go on to next letter. Teacher records correct response by circling letter on answer sheet.

d f c b a p s q t z r e j g m u x h w I k n v o y l

Letter Sound Recognition Using the lower case letter card, student identifies consonant sounds and short vowel sounds. If student gives long vowel sound or soft sound for g/c, teacher redirects. Teacher records correct response by circling letter on answer sheet.

d f c b a p s q t z r e j g m u x h w i k n v o y l

Rhyming Recognition Begin by explaining that two words rhyme when they sound the same at the end of the word. Give example: cat/hat. Give an example of one that doesn't rhyme: bed/rug. Ask student to tell you "yes" if the words below rhyme, "no" if they don't rhyme. Circle correct answers.

lip / sip tell / sell boy / duck sick / desk can / van

Rhyming Production Remind student that words that rhyme sound the same at the end of the word. Give example: cat/mat. Ask them to think of another word that rhymes with cat. Ask them to make up some rhyming words to go with the words below. Nonsense words count. Write their responses on the lines.

cat _____ run _____ fill _____ let _____ mop _____

Initial Sound Recognition Teacher names all the pictures in each row. Student then points to the picture in that row that has the same beginning sound as the first picture in each row. Teacher circles correct answers. **Example: house/hat**

bed/bird top/turtle sun/sock moon/monkey fish/fork

Initial Sound Production Teacher names each picture. Student writes word for each picture. Response is correct if initial sound is represented correctly.

(Child is shown four pictures for each letter choice.)

p

s

b

d

m

MATH

Counting Aloud to 30 (30 points possible)

Student counts to 30. If the student makes an error before reaching 30, give credit for the numbers correctly said before the error.

Numerals Recognition 1 to 20 (20 points possible)

Using the numeral cards, student names each numeral. If student doesn't know a numeral, skip it and go on to next numeral.

5 3 8 6 1 7 2 4 10 9
16 15 11 18 20 12 19 13 17 14

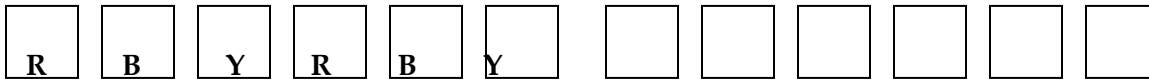
AB Pattern Recognition and Extension (12 points possible, 6 for naming the pattern and 6 for reproducing and extending the pattern)

Using a pattern card and colored cubes, student names the AB pattern then reproduces and extends it by placing colored cubes that would continue the pattern.

B	Y	B	Y						
---	---	---	---	--	--	--	--	--	--

ABC Pattern Recognition and Extension (12 points possible, 6 for naming the pattern and 6 for reproducing the pattern)

Using a pattern card and colored cubes, student names the ABC pattern then reproduces and extends it by placing colored cubes that would continue the pattern.



Count Objects 1-to-1 correspondence (20 points possible)

Using a card with 20 shapes on it or 20 pennies, student points to and counts the shapes. If the student makes an error before reaching 20, give credit for the shapes counted before the error.

Recognize numerical value of amounts to 5 (6 points possible)

Using the numerical value picture cards or a die cube, student identifies the number of dots on the card or die face, without counting. Teacher records correct response by circling the numbers on this answer sheet.